9 Solving Systems of Linear Equations Algebraically

General Outcome

Develop algebraic and graphical reasoning through the study of relations.

Specific Outcomes

RF9 Solve problems that involve systems of linear equations in two variables, graphically and algebraically.

By the end of this chapter, students will be able to

Section	Understanding Concepts, Skills, and Processes
9.1	✓ solve systems of linear equations algebraically using substitution
9.2	✓ write equivalent equations to eliminate a variable
	✓ solve systems of linear equations algebraically using elimination
9.3	✓ choose a strategy to solve a problem that involves a system of linear equations

Assessment	Supporting Learning
Assessment *as* Learning	
Use the Before column of **BLM 9–1 Chapter 1 Self-Assessment** to provide students with the big picture for this chapter and help them identify what they already know, understand, and can do. You may wish to have students keep this master in their math portfolio and refer back to it during the chapter.	• During work on the chapter, have students keep track of what they need to work on in the What I Need to Work On section of their Foldable. They can check off each item as they develop the skill or process at an appropriate level.
Assessment *for* Learning	
Method 1: Use the introduction on page 466 in *Mathematics 10* to activate student prior knowledge about the skills and processes that will be covered in this chapter. **Method 2:** Have students develop a journal entry to explain what they personally know about systems of linear equations and linear equations. You might provide the following prompts: • How might systems of linear equations apply to real life? • What are some examples of systems of linear equations? • What are some ways you can represent systems of linear equations? • How do you solve a system of linear equations graphically? • How do you solve a linear equation algebraically?	• Have students use the What I Need to Work On section of their Foldable to keep track of the skills and processes that need attention. They can check off each item as they develop the skill or process at an appropriate level. • Students who require activation of prerequisite skills may wish to complete **BLM 9–2 Chapter 9 Prerequisite Skills**. This material is on the Teacher CD of this Teacher's Resource and mounted on the www.mhrmath10.ca book site.
Assessment *as* Learning	
Chapter 9 Foldable As students work on each section in Chapter 9, have them keep track of any problems they are having in the What I Need to Work On section of their Foldable.	• As students complete each section, have them review the list of items they need to work on and check off any that have been handled. • Encourage students to write definitions for the Key Terms in their own words, including reminder tips that may be helpful for review throughout the chapter. • Encourage students to write examples of their own into their notebook or math portfolio. They should have at least one example for each method that is covered in the chapter.
Assessment *for* Learning	
BLM 9–3 Chapter 9 Warm-Up This reproducible master includes a warm-up to be used at the beginning of each section. Each warm-up provides a review of prerequisite skills needed for the section.	• As students complete questions, note which skills they are retaining and which ones may need additional reinforcement. • Use the warm-up to provide additional opportunities for students to demonstrate their understanding of the chapter material. • Have students share their strategies for completing math calculations.

Chapter 9 Planning Chart

Section/ Suggested Timing	Prerequisite Skills	Materials/Technology	Teacher's Resource Blackline Masters	Exercise Guide	Assessment		
					Assessment *as* Learning	Assessment *for* Learning	Assessment *of* Learning
Chapter Opener • 20–30 min (TR page 339)	Students should be familiar with • solving linear equations • solving linear systems graphically		BLM 9–1 Chapter 9 Self-Assessment BLM 9–2 Chapter 9 Prerequisite Skills BLM 9–4 Chapter 9 Unit 4 Project BLM U4–1 Unit 4 Project BLM U4–2 Unit 4 Project Checklist		TR page 338 Chapter 9 Foldable, TR page 338	TR page 338	
9.1 Solving Systems of Linear Equations by Substitution • 60–75 min (TR page 341)	Students should be familiar with • solving linear equations • solving linear systems graphically • multiplication of a linear equation by a constant • numerical substitution and evaluation of a linear equation • the relationship between distance, velocity, and time		BLM 9–3 Chapter 9 Warm-Up BLM 9–4 Chapter 9 Unit 4 Project BLM 9–5 Section 9.1 Extra Practice	**Essential:** #1–3, 6–9, 12, 13, 15, 19, 26 **Typical:** #1–8, three of 9–13, 15–17, 19, 25, 26 **Extension/Enrichment:** #3–5, 7, 8, 15, 18–26	TR pages 342, 346 Chapter 9 Foldable, TR page 338	TR pages 344, 346	
9.2 Solving Systems of Linear Equations by Elimination • 60–75 min (TR page 347)	Students should be familiar with • solving linear equations • solving linear systems graphically • multiplication of a linear equation by a constant • numerical substitution and evaluation of a linear equation • the relationship between distance, velocity, and time		BLM 9–3 Chapter 9 Warm-Up BLM 9–4 Chapter 9 Unit 4 Project BLM 9–6 Section 9.2 Extra Practice	**Essential:** #1–4, 7–9, 13, 14, 20, 21 **Typical:** #1–3, 5, three of 7–12, 14–16, 20, 21 **Extension/Enrichment:** #2, 5, two of 10–13, 14– 21	TR pages 348, 353 Chapter 9 Foldable, TR page 338	TR pages 351, 353	
9.3 Solving Problems Using Systems of Linear Equations • 60–75 min (TR page 354)	Students should be familiar with • solving linear equations • multiplication of a linear equation by a constant • solving linear systems graphically • numerical substitution and evaluation of a linear equation variable • the relationship between distance, velocity, and time	• graphing calculator or spreadsheet software	BLM 9–3 Chapter 9 Warm-Up BLM 9–4 Chapter 9 Unit 4 Project BLM 9–7 Section 9.3 Extra Practice	**Essential:** #1–3, 5, 8, 9, 14 **Typical:** #1–7, 9, 11, 14, 15 **Extension/Enrichment:** #2, 9–13, 15	TR pages 355, 359 Chapter 9 Foldable, TR page 338	TR pages 356, 357, 359	
Chapter 9 Review • 60–75 min (TR page 360)		• graphing calculator	BLM 9–5 Section 9.1 Extra Practice BLM 9–6 Section 9.2 Extra Practice BLM 9–7 Section 9.3 Extra Practice	Have students do at least one question related to any concept, skill, or process that has been giving them trouble.	Chapter 9 Foldable, TR page 338	TR page 361	
Chapter 9 Practice Test • 50–60 min (TR page 362)		• graphing calculator	BLM 9–8 Chapter 9 Test	Provide students with the number of questions they can comfortably do in one class. Choose at least one question for each concept, skill, or process. **Minimum:** #1–6, 8, 9	TR page 362		TR page 362 BLM 9–8 Chapter 9 Test
Unit 4 Project • 90–120 min (TR page 363)			Master 1 Project Rubric BLM U4–3 Unit 4 Project Final Report BLM 8–4 Chapter 8 Unit 4 Project BLM 9–4 Chapter 9 Unit 4 Project				TR page 363 Master 1 Project Rubric
Unit 4 Review and Test • 60–90 min (TR page 365)		• graphing calculator • ruler • grid paper	BLM 9–9 Chapter 9 BLM Answers	Have students do at least one question related to any concept, skill, or process that has been giving them trouble.	Chapters 8 and 9 Foldables	TR page 366	TR page 366